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(54) SLIDING DOOR ASSEMBLY

(71) I, LEO MAKELA, of Vesivehmaa, Finland; a Finnish citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to sliding door assemblies.

It is an object of the invention to provide improvements over the prior art.

According to the present invention there is provided a sliding door assembly comprising at least a pair of separate doors suspended by hook-like supports slidable along a groove in a support member, the support member having a top flange overlying the major part of the length of the groove to limit upward movement of the door supports and thereby maintain the latter within the said groove, wherein the said flange has cut away portions with guide flanges angled with respect to the top flange to allow the door supports limited upward movement at said cut away portions and to constrain the said supports, and therewith the door, to move out of their original plane and into a second plane parallel to the said original plane a distance sufficient to enable one door to pass another along the support member, the said supports each having a spigot extending therefrom to engage inverted U shaped extensions on the guide flanges and thereby limit their own upward movement.

Preferably each guide flange extension comprises an outwardly angled free edge.

Advantageously the doors are provided with fingerholes whereby they may be lifted upwards to engage their supports against the guide flanges.

In accordance with a preferred embodiment of the invention the doors are slidably mounted within a door frame which comprises a lever mechanism operative on cam members engageable with the lower edge of the doors to lift them upwards whereby their support members engage the guide flanges.

In order that the invention may be more readily understood, reference will now be

made to the accompanying drawings, which are given by way of example and in which:

Figure 1 shows a part of conventional sliding door assembly, with Figure 1A a sectional view taken along the lines IA—IA;

Figure 2 shows a part of first embodiment of the sliding door assembly according to the invention;

Figures 3 and 3A show a part of an assembly according to the invention, Figure 3A being a section taken along the lines IIIA—IIIA;

Figures 4 and 4A show the assembly part of Figure 3 in use, Figure 4A being a section taken along the lines IVA—IVA.

Figures 5 and 5A show the assembly part in another position of use, Figure 5A being a section taken along the lines VA—VA.

Figures 6 and 6A show the door assembly according to the invention, Figure 6 being a front view and Figure 6A being a section taken along the lines VIA—VIA;

Figures 7, 7A, 8 and 8A show details of a lever mechanism for a sliding door assembly according to the invention, Figures 7A and 8A being respectively sections taken along the lines VIIA—VIIA and VIIIB—VIIIB.

Figures 9 and 10 show complete assemblies in front view.

Like reference numerals denote like parts throughout but in the interests of clarity some reference numerals are omitted from some figures.

In Figures 1 and 1A a sliding door 1 carries supports 2. Each support 2 takes the form of a strip secured to the door 1 by one end and bent into a U-shaped hook 6 at its free end. A fixed elongated support member 3 has a front edge 4 and a rear edge 8 which are both turned upwardly to define a groove therebetween in which the hooks 6 are received, the rear edge 8 being turned over at its top as a flange 5 to overlie the hooks 6 and restrain them from upwards movement out of the groove.

In accordance with the invention the supports 2 are each provided with a spigot 7 retained within the curve of the U-shaped

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hook 6 (see Figure 2). As shown in Figure 3 the top flange 5 is severed at spaced locations 20 to permit the provision of guide flanges 9 which are angled upwardly at about 45 degrees with respect to the flange 5. Each guide flange 9 carries at one end a U-shaped extension 10 of which the lower edge 11 is turned outwardly away from the edge 4 of the support 3 (towards which edge the remainder of the extension 10 is directed). The limb of the U extension 10 is roughly parallel with the guide flange 9 and the length of the flange 9 is at least as long as the sum of the breadth of a support 2 and the length of that part of its spigot 7 which extends outwardly from the said support.

The relative arrangement of the supports 2 and the guide flanges 9 at the cut away portions 20 is preferably such that when the one is opposite the other the door 1 overlies the gap which it is to close. When the door is in this position (Figures 4 and 4A) and is moved upwardly, each support 2 abuts its respective guide flange 9 and slides cam-like upwardly and over the flange until the spigot engages in the inverted base part of the U extension 10 (Figure 5 and 5A) to limit further upward movement. The door may now be moved sideways to an extent limited by the extension 10, but it may not be moved upwards. As will be evident the described camming of the support 2 on the guide flange 9 will have caused the support and door to move bodily outwards away from the support 3. In this manner one door 1 may be displaced bodily upwards and outwards with respect to another door 1, thereby to allow the one door to pass the other along the support 3.

In practice the door 1 is conveniently lifted manually by grasping fingerholes 12 provided for the purpose or by means of a lever mechanism 13, 14, 15, 16. For the purposes of explanation the left hand door 1 of Figure 6 is shown with fingerholes 12 and the right hand door of the same figure is shown with a lever mechanism. In Figures 7, 7A, 8 and 8A the lever mechanism is shown in more detail and it should be noted that such an arrangement is especially desirable for heavy doors. As shown, a shaft 13, which is rotatable by a crank handle 14, is carried by bearings in a door frame 17. A cam arrangement 15, 16 is carried on the shaft 13 which bears on, or is engaged with, the lower edge of the door so that when the crank handle 14 is turned, the door is moved both upwards and outwards at the same time. Figures 8 and 8A show the door in a rest position (broken lines) and a lifted and displaced position (full lines).

As shown it is convenient to provide an elongated beam 19 along the bottom of the door frame, to act as a stop for the cam arrangement 15, 16, together with a base member 22 with a front flange 21 serving as a

front guide stop for the door. It is also convenient to provide the door with a base channel 18 in which the cam members of the lever mechanism may positively engage. The flange 21 serves not only to protect and guide the lower edge of the door but also to protect the lever mechanism. By suitable arrangement of the dead centre of the cam and lever arrangement, security of the door in its rest position will be assured.

It is envisaged that the invention will find particularly valuable application in trucks and transport but such a recommendation is intended to be in no way limiting.

WHAT I CLAIM IS:—

1. A sliding door assembly comprising at least a pair of separate doors suspended by hook-like supports slidable along a groove in a support member, the support member having a top flange overlying the major part of the length of the groove to limit upward movement of the door supports and thereby maintain the latter within the said groove, wherein the said flange has cut away portions with guide flanges angled with respect to the top flange to allow the door supports limited upward movement at said cut away portions and to constrain the said supports, and therewith the door, to move out of their original plane and into a second plane parallel to the said original plane a distance sufficient to enable one door to pass another along the support member, the said supports each having a spigot extending therefrom to engage inverted U shaped extensions on the guide flanges and thereby limit their own upward movement.

2. A sliding door assembly according to claim 1, wherein each guide flange extension comprises an outwardly angled free edge.

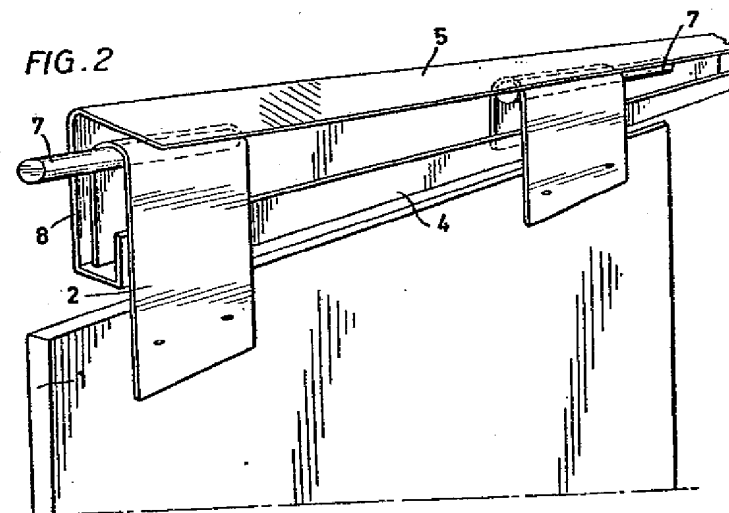
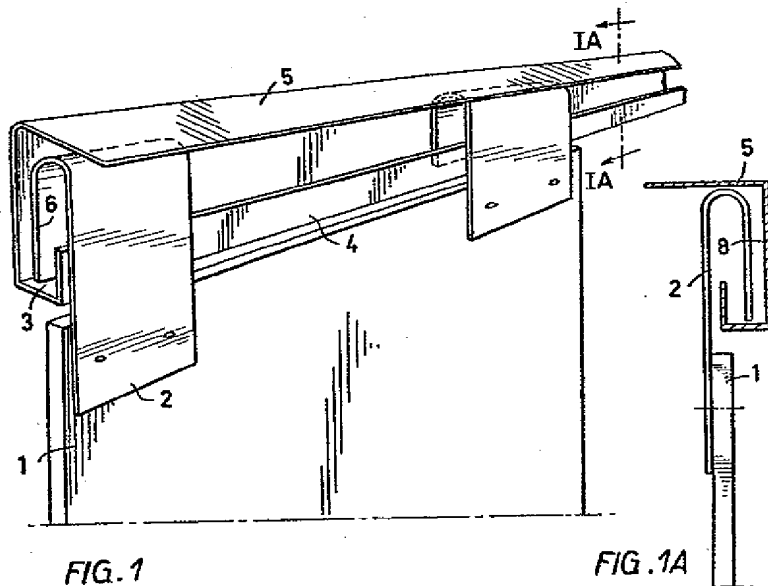
3. A sliding door assembly according to either of the preceding claims wherein the doors are provided with fingerholes whereby they may be lifted upwards to engage their supports against the guide flanges.

4. A sliding door assembly according to any of the preceding claims wherein the doors are slidably mounted within a door frame which comprises a lever mechanism operative on cam members engageable with the lower edge of the doors to lift them upwards whereby their support members engage the guide flanges.

5. A sliding door assembly as claimed in any of the preceding claims wherein the guide flanges are angled at 45° with respect to the top flange.

6. A sliding door assembly substantially as hereinbefore described with reference to Figures 2 to 10 of the accompanying drawings.

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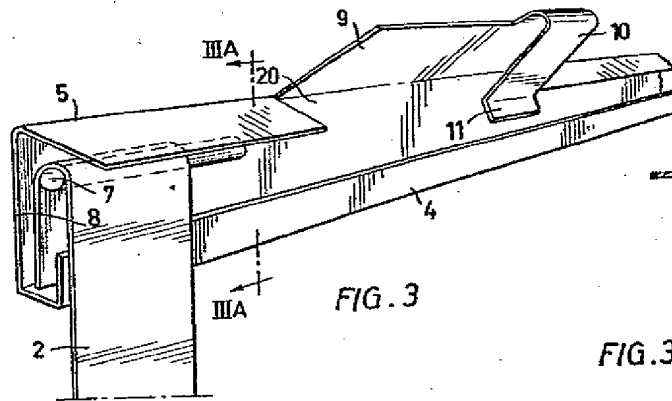


FIG. 3

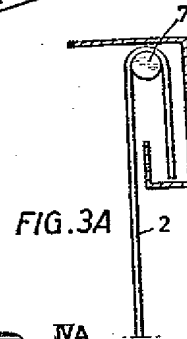


FIG. 3A

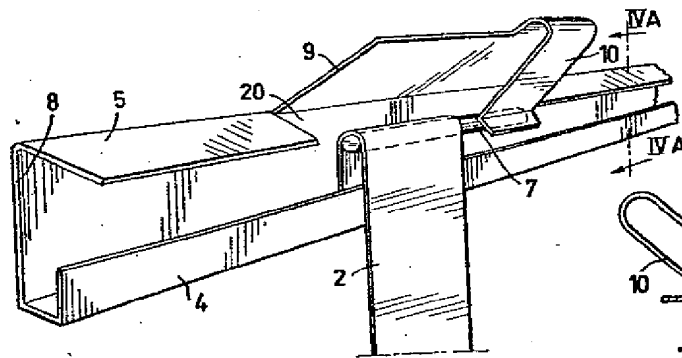


FIG. 4

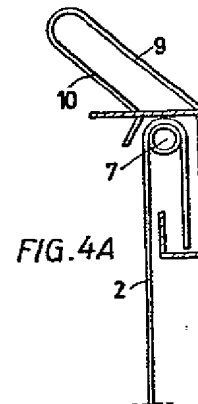
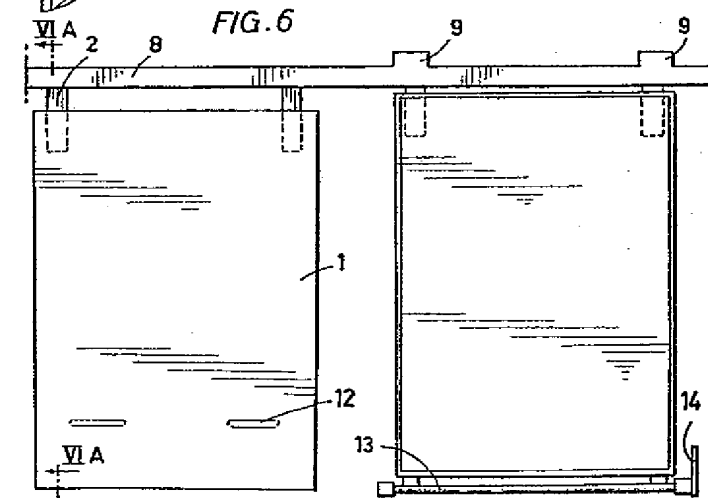
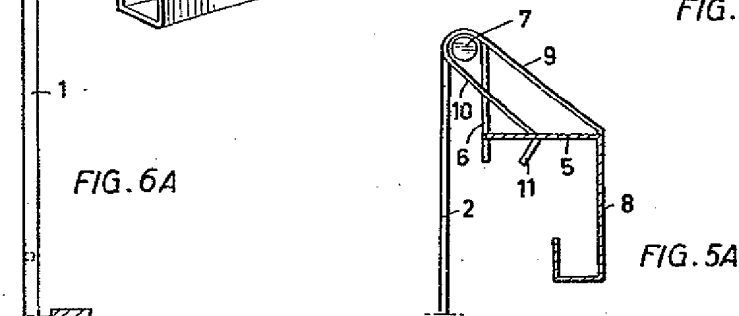
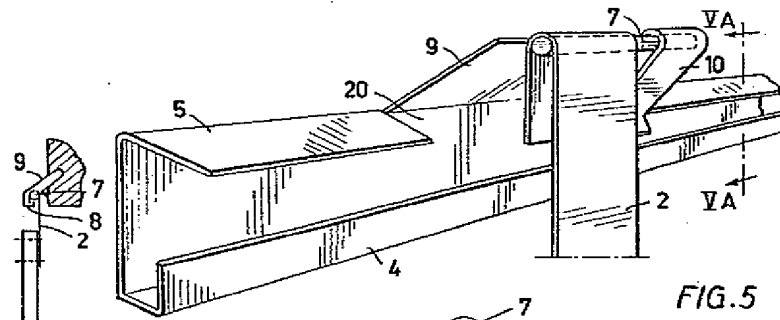


FIG. 4A



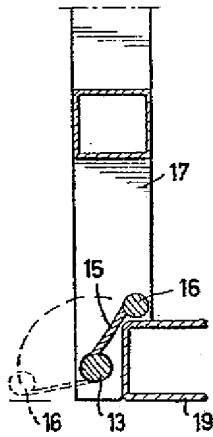


FIG. 7A

FIG. 8A

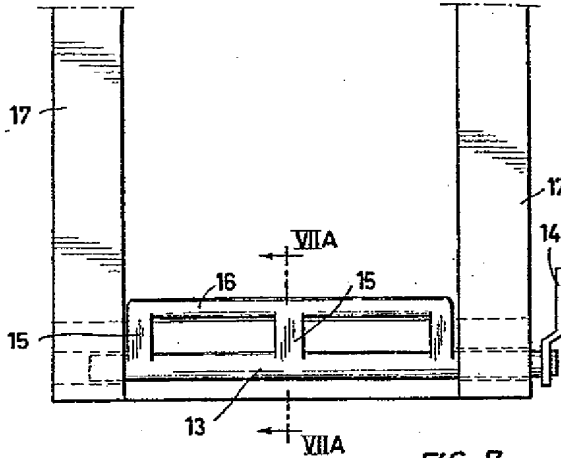
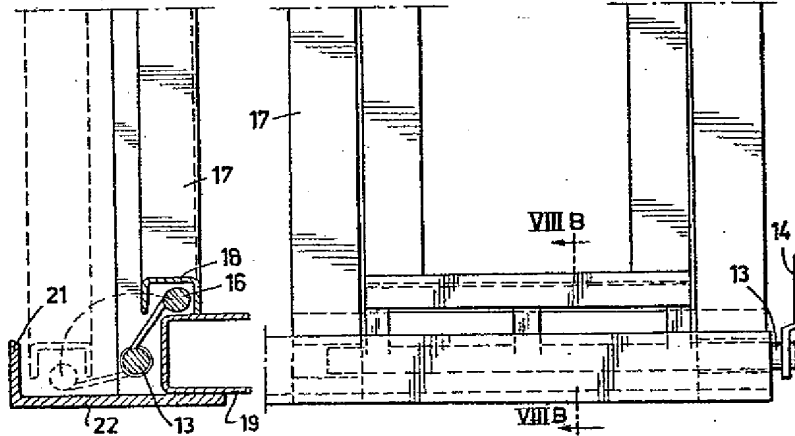


FIG. 7

FIG. 8



VIII B

VIII B

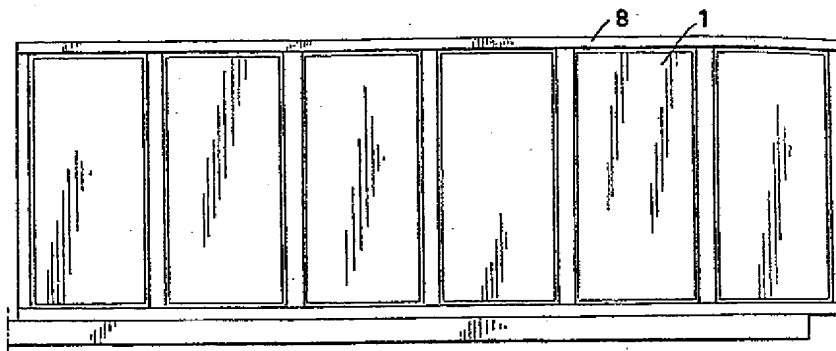


FIG. 9

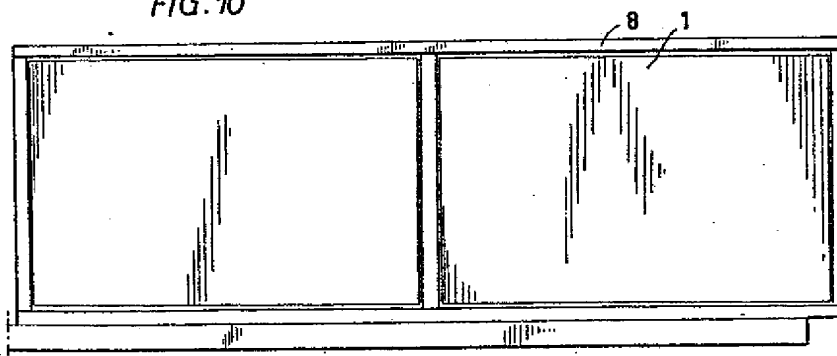


FIG. 10